II. REMARKS

Formal Matters

Claims 1-44 are pending after entry of the amendments set forth herein.

Claims 1-44 were examined. Claims 1-44 were rejected.

Figure 1 is amended to comply with MPEP § 608.02(g), indicating that the subject matter of Figure 1 is prior art.

The specification is amended in one place in order to allow the figures to comply with 37 CFR § 1.84(p)(5). The reference sign "154" in the written description has been amended to "181".

The trademarks DELRIN and TEFLON are amended to be in capital letters in the specification. Generic terminology accompanies these trademarks.

Substitute Figures 1-4 are filed with this response, with a "redline" marked up copy of each figure to show changes made. Support for the amendments to Figures 2-4 may be found on page 11 lines 25-32.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached is captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE."**

No new matter is added by these amendments. As such, entry of the above amendments is respectfully requested.

Applicants respectfully request reconsideration of the application in view of the amendments and remarks made herein.

Objections to the Drawings

Figure 1 was objected to as being incorrectly labeled. Applicants have amended the legend of Figure 1 to include the words "Prior Art". This objection is believed to have been addressed by this amendment, and Applicants respectfully request withdrawal of this objection.

The drawings were objected to as failing to comply with 37 CFR § 1.84(p)(5), assertedly because a) the written description of the drawing recites the reference sign "154", which is not shown in a drawing, and b) because the drawings show a reference sign "153" which is not described in the written description.

The specification has been amended to provide a description of element "154".

Applicants respectfully submit that description of reference sign "153" may be found in line 25 on page 9 of the specification.

Applicants respectfully submit that the drawings are in compliance with 37 CFR § 1.84(p)(5) and that these objections are addressed. Applicants respectfully request withdrawal of these objections.

Objections to the Specification

The specification has been objected to because of the use of the trademarks DELRIN and TEFLON. The specification has been amended to recite these trademarks in capital letters. The generic terminology for these trademarks is already present in the specification: TEFLON is generically known as tetrafluoroethylene, and DELRIN is generically known as acetal resin. These generic terms are found at the same positions as the trademarks.

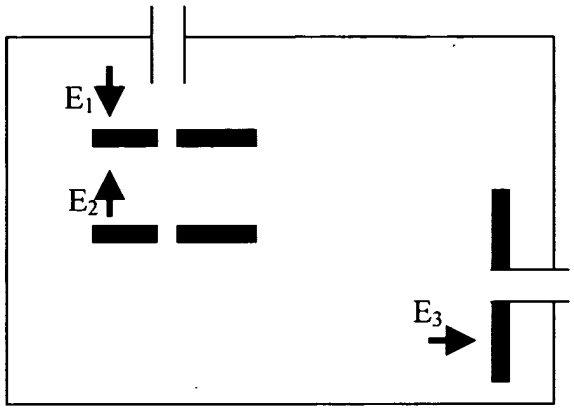
This objection is believed to have been addressed by this amendment. Applicants respectfully request withdrawal of this objection.

Rejection of claims under 35 U.S.C. § 102

Claims 1-3, 6, 7, 19, 23-25, 28, 29 and 41 are rejected under 35 U.S.C. § 102(b) as anticipated by Park et al (6,410,914), assertedly because Park discloses an ionization chamber that anticipates the claimed invention. Applicants respectfully traverse this rejection.

The subject claims are directed to compositions and methods involving an

ionization chamber having, *inter alia*, three electric fields and means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode. Solely for the Examiner's convenience and without any intention to limit the invention, an exemplary arrangement of electric fields is illustrated in the following figure (adapted from Fig. 2 of the instant application).



As the Examiner has correctly pointed out on page 6 of the Office Action, Park does not disclose an apparatus having three electric fields within the ionization chamber. Further, since the Park apparatus only discloses two electric fields, one of which surrounds the base of the sample inlet needle, ions exiting the sample inlet needle pass though only one electric field. As such, Park also fails to provide means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode.

As such, Park fails to teach all the elements of the rejected claims. Accordingly, Park cannot anticipate the claimed invention and the rejection of claims 1-3, 6, 7, 19, 23-25, 28, 29 and 41 under 35 U.S.C. § 102(b) over Park et al may be withdrawn.

Rejection of claims under 35 U.S.C. § 103-Park in view of Carnahan

Claims 4, 5, 15-17, 26, 27 and 37-39 are rejected under 35 U.S.C. § 103(a)

over Park in view of Carnahan (5,420,424), assertedly because the electrospray device of Park, combined with the parallel, flat surface, opposite polarity electrodes of Carnahan, render the subject matter of these claims obvious. Applicants respectfully traverse this rejection.

Carnahan is cited for disclosing a cylindrical spectrometry device containing two electrodes that run parallel to the length of the device.

As established above, Park is deficient in that it does not disclose an ionization chamber having three electric fields and means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode. The electrodes of Carnahan fail to overcome this deficiency. As such, the combination of Park's ionization chamber with the electrodes of Carnahan fails to teach at least one element of the claimed invention.

Furthermore, even if Carnahan did meet Park's deficiencies, Carnahan only discloses electrodes that run *parallel* to the gas flow path (see figure 1- gas flow is from left to right). As such, Carnahan does not teach the subject matter of claims 5 and 27, which state that the gas flow is substantially *orthogonal* to the flat surfaces of the electrodes.

As such, Applicants respectfully submit that the references fail to teach at least one element of the claimed invention. Since the references fail to teach all of the elements of the claimed invention, they cannot be used to establish a *prima facie* case of obviousness. Accordingly the rejection of Claims 1-20 and 34-36 under 35 U.S.C. § 103(a) may be withdrawn.

Rejection of claims under 35 U.S.C. § 103-Park in view of Yano

Claims 8 and 30 are rejected under 35 U.S.C. § 103(a) over Park in view of Yano (5,481,108), assertedly because the electrospray device of Park, combined with the mesh electrodes of Yano, render the subject matter of these claims obvious. Applicants respectfully traverse this rejection.

Yano discloses a mass spectrometry ion detection device. It is cited for providing a perforated electrode.

As established above, Park is deficient in that it does not disclose an ionization chamber having three electric fields and means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode. The perforated electrodes of Yano fail to overcome this deficiency. As such, the combination of Park's ionization chamber with the electrodes of Yano fails to teach the claimed invention.

As such, Applicants respectfully submit that the references fail to teach at least one element of the claimed invention. Since the references fail to teach all of the elements of the claimed invention, they cannot be used to establish a *prima facie* case of obviousness. Accordingly the rejection of Claims 8 and 30 under 35 U.S.C. § 103(a) may be withdrawn.

Rejection of claims under 35 U.S.C. § 103-Park in view of Whitehouse

Claims 9, 14, 21, 22, 31, 36 and 43 are rejected under 35 U.S.C. § 103(a) over Park in view of Whitehouse (6,060,705), assertedly because the electrospray device of Park, combined with the vacuum interface, gaseous stream and scup of Whitehouse, render the subject matter of these claims obvious. Applicants respectfully traverse this rejection.

Whitehouse discloses an electrospray ionization device. Whitehouse is cited for disclosing an "aperture" type vacuum interface, a means for producing a gaseous stream and a scupper attached to the second electrode.

As established above, Park is deficient in that it does not disclose an ionization chamber having three electric fields and means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode.. The vacuum interface, means for producing a gaseous stream and scupper of Whitehouse fail to overcome this deficiency. As such, the combination of Park's ionization chamber with the electrodes of Whitehouse fails to teach the claimed invention.

As such, Applicants respectfully submit that the references fail to teach at least one element of the claimed invention. Since the references fail to teach all of

the elements of the claimed invention, they cannot be used to establish a *prima facie* case of obviousness. Accordingly the rejection of Claims 9, 14, 21, 22, 31, 36 and 43 under 35 U.S.C. § 103(a) may be withdrawn.

Rejection of claims under 35 U.S.C. § 103-Park in view of Gourley

Claims 10-13, 18, 20, 32-35, 40 and 42 are rejected under 35 U.S.C. § 103(a) over Park in view of Gourley (5,753,910), assertedly because the electrospray device of Park, combined with the vacuum interface and atmospheric pressure grounded chamber of Gourley, render the subject matter of these claims obvious. Applicants respectfully traverse this rejection.

Gourley discloses an chamber seal for atmospheric pressure ionization mass spectroscopy. Gourley is cited for disclosing an "conduit" type vacuum interface that contains metallic, conductively insulating material, and for disclosing an ionization chamber at atmospheric pressure that is grounded.

As established above, Park is deficient in that it does not disclose an ionization chamber having three electric fields and means for generating a gaseous stream in a gas flow path extending from a first electrode to a second electrode. The vacuum interface and atmospheric pressure grounded ionization chamber of Gourley fail to overcome this deficiency. As such, the combination of Park's ionization chamber with the interface and chamber of Gourley fails to teach the claimed invention.

As such, Applicants respectfully submit that the references fail to teach at least one element of the claimed invention. Since the references fail to teach all of the elements of the claimed invention, they cannot be used to establish a *prima facie* case of obviousness. Accordingly the rejection of Claims 10-13, 18, 20, 32-35, 40 and 42 under 35 U.S.C. § 103(a) may be withdrawn.

Rejection of claims under 35 U.S.C. § 103-Park in view of Apffel

Claim 44 is rejected under 35 U.S.C. § 103(a) over Park in view of Apffel

(6,294,779), assertedly because the electrospray device of Park, combined with multi-electric field ionization chamber and ion trajectory angles of Gourley, render the subject matter of these claims obvious. Applicants respectfully traverse this rejection.

Park is deficient in that it does not disclose a method transporting ions through three electric fields where the angles of the ion trajectories relative to the electric fields are, in order: 1) no greater than 90°, 2) greater than 90°, and 3) no greater than 90°.

Apffel discusses ion trajectory angles in column 6 on lines 35-56. Apffel explains that the "angle θ of the center axis of the exiting electrosprayed aerosol 11 and the center axis of the second passageway 22 is between 75 and 105 degrees *with respect to each other*" and "the angle θ defines the location of the first passageway 14 that is, the nebulizer of other source of electrosprayed aerosol 11, *relative to the second passageway* 22, that is, the entry into the vacuum system" (emphasis added). As such, Apffel is merely stating that the angle of the entry passageway (the nebulizer), relative to the angle of the exit passageway (the vacuum entryway) is between 75 and 105 degrees (approximately right angles). Apffel does not discuss the trajectory of an ion in relation to an electric field, or disclose two angles being less than 90° and one being greater than 90° as the Office Action states.

A review of the entire Apffel specification indicates Apffel does not disclose an method that involves transporting ions through three electric fields where the angles of the ion trajectories relative to the electric fields are, in order: 1) no greater than 90°, 2) greater than 90°, and 3) no greater than 90°.

As such, Park and Apffel, either together or in combination, fail to teach a method involving three electric fields where the angles of the ion trajectories relative to the electric fields are, in order: 1) no greater than 90°, 2) greater than 90°, and 3) no greater than 90°. Further, since Apffel's ionization chamber would fail to operate if such an arrangement of electric fields was used, one of skill in the art would be let away from combing the references the references.

Since the references cannot be combined to make the claimed invention,

and because one of skill in art would be let away from combing the references even if they could be successfully combined, they cannot be used to render the subject matter of claim 44 obvious.

Applicants respectfully submit that this rejection has been addressed. Accordingly, the rejection of claim 44 under 35 U.S.C. § 103(a) over Park in view of Apffel may be withdrawn.

III CONCLUSION

The applicants respectfully submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone Timothy Joyce at 650 485 4310. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1078.

Respectfully submitted,

Date: 2.24.03

By: _____
Bret E. Field
Registration No. 37,620

Date: 2.24.03

By: _____
James S. Keddie, Ph.D.
Registration No. 48,920

VERSION WITH MARKINGS TO SHOW CHANGES MADE

The paragraph starting on page 9 line 29 is amended as follows:

--The vacuum interface 180 is also electrically connected due to physical contact to the housing of the ionization chamber and is typically operated at approximately ground potential, that is, at a voltage from about -400 volts to 400 volts, typically from about -40 volts to about 40 volts, more preferably from about -10 volts to about 10 volts. The housing may be fabricated from any material providing the requisite structural integrity and which does not significantly degrade, corrode, or outgas under typical conditions of use. Typical housings are fabricated from materials including metals such as stainless steel, aluminum, and aluminum alloys, and other electrically conductive materials. Parts of the housing may include plastics, such as ~~Delrin~~ **DELRIN** ® acetal resin and tetrafluoroethylene, e.g., ~~Teflon~~ **TEFLON** ®. Composite or multilayer materials may also be used.--

The paragraph starting on page 13 line 12 is amended as follows:

--As shown, a vacuum interface 180 is provided to allow communication between the ionization chamber 100 and the vacuum chamber 190. The vacuum interface 180 comprises a dielectric capillary 151 and an electrode ~~154~~ **181** and is similar to those used in conventional ionization chambers. The vacuum interface 180, and the electrode in particular, is electrically connected by direct physical contact with a wall of the apparatus separating the ionization chamber and the vacuum chamber. The interface may have any voltage as long as the interface voltage is more attractive to the ion than the voltage of the second electrode. Preferably, the interface voltage is at approximately ground potential. Because of the voltage difference between the second electrode and the vacuum interface, an ion emerging from the second electrode orifice will be repelled from the second electrode and attracted to the vacuum interface. As a result, the ion will travel

through the vacuum interface and into the vacuum chamber. The ion can optionally be delivered to a mass analyzer (not shown in FIG. 2) in a vacuum chamber, optionally through additional ion optical elements (not shown) as is known in the art. Alternatively stated, a third electric field is created between the second electrode and the vacuum interface. The third electric field has an associated direction as indicated by arrow E_3 extending from the second electrode to the vacuum interface. As shown, the third electric field direction is substantially orthogonal to the flow path of the gas stream. Such orthogonality is optimal but not critical to the invention. In general, it is preferred that the flow path of the gas stream does not intersect the vacuum interface. When the flow path of the gas stream intersects with the vacuum interface, droplets contacting the interface may result in excel mass detector signal noise. However, the direction of drying air may be reversed to effect entrainment of ions toward the vacuum interface as shown.--

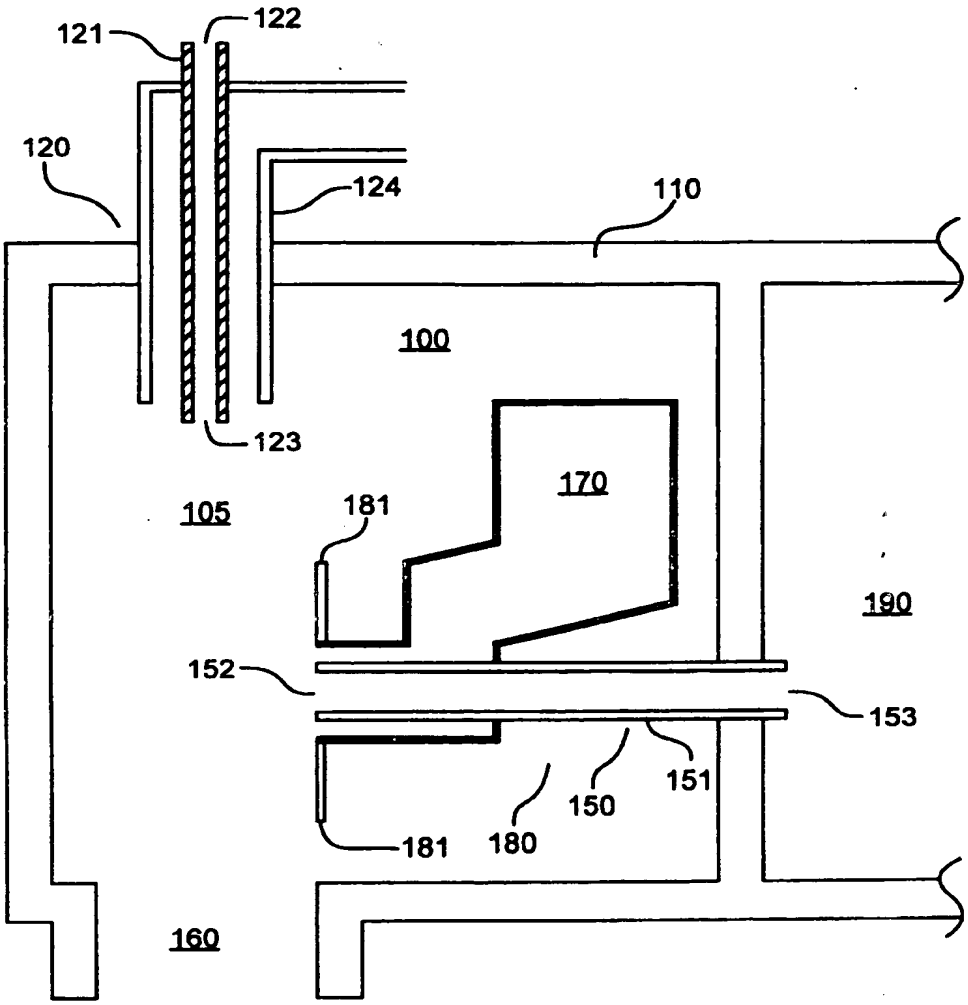


FIG. 1
(PRIOR ART)

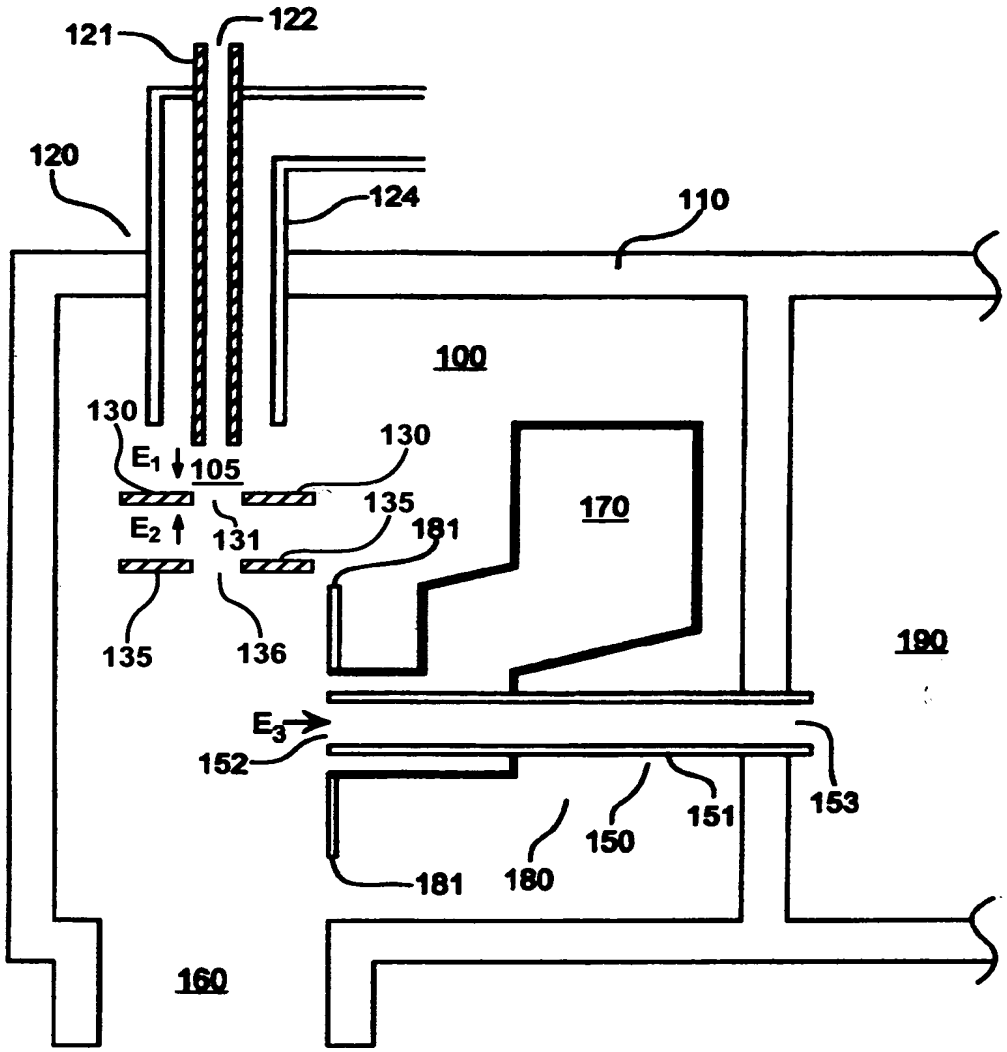


FIG. 2

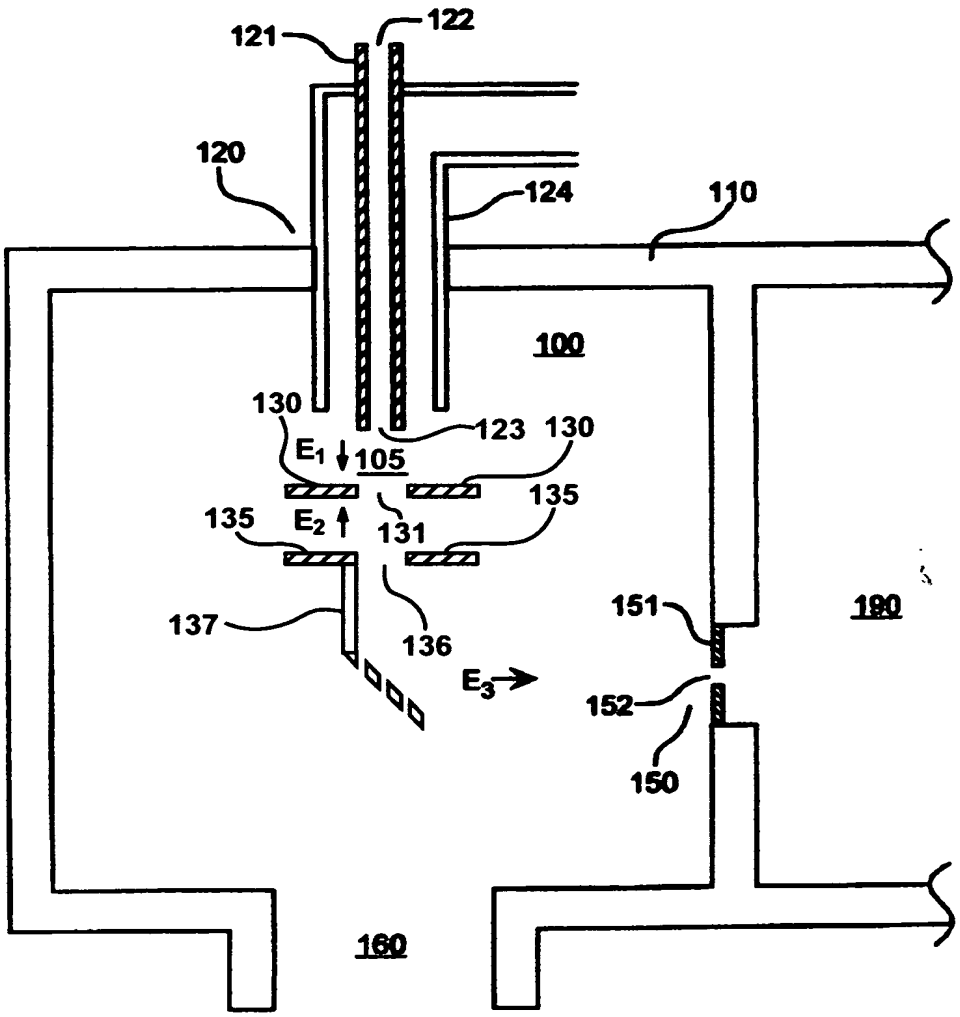


FIG. 3

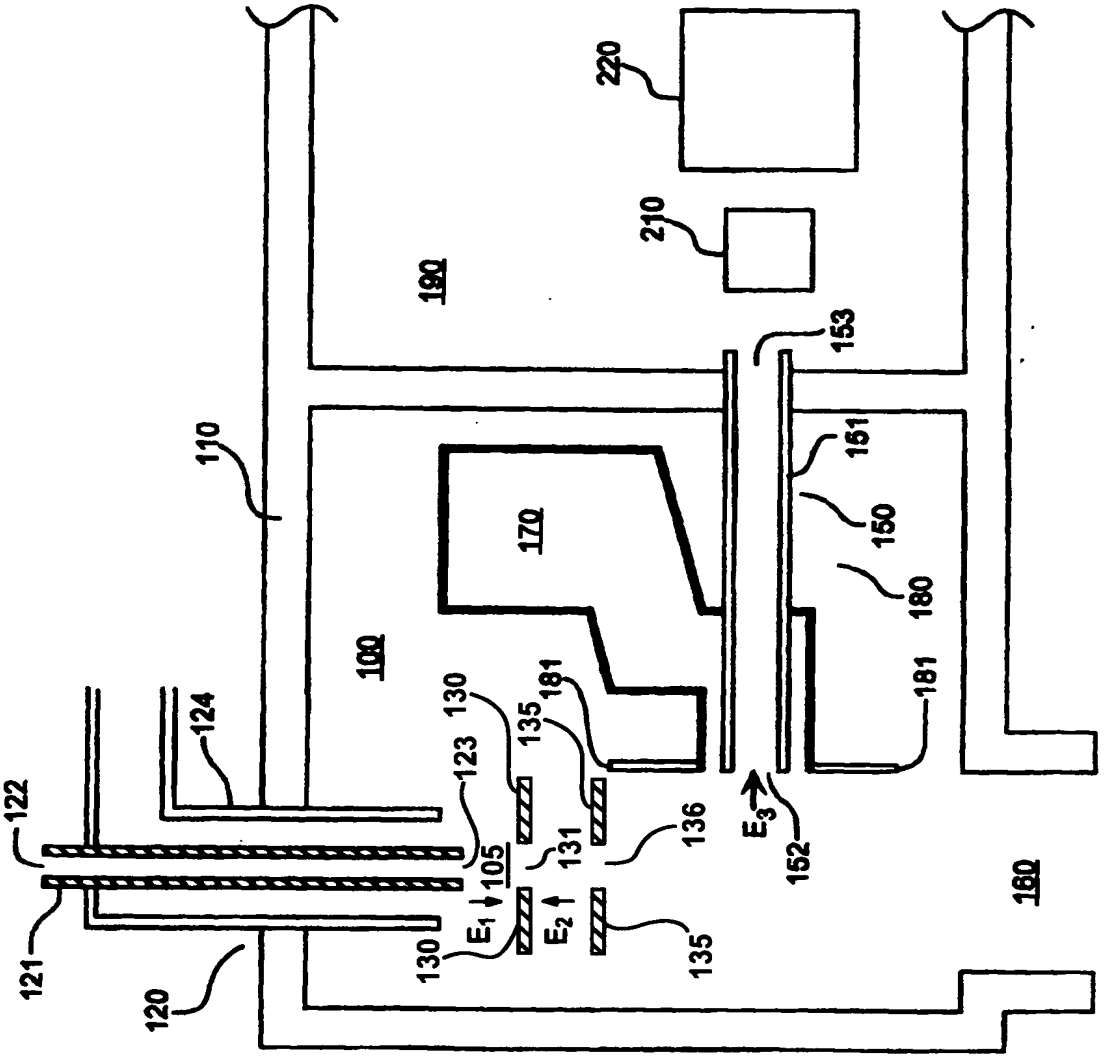


FIG. 4

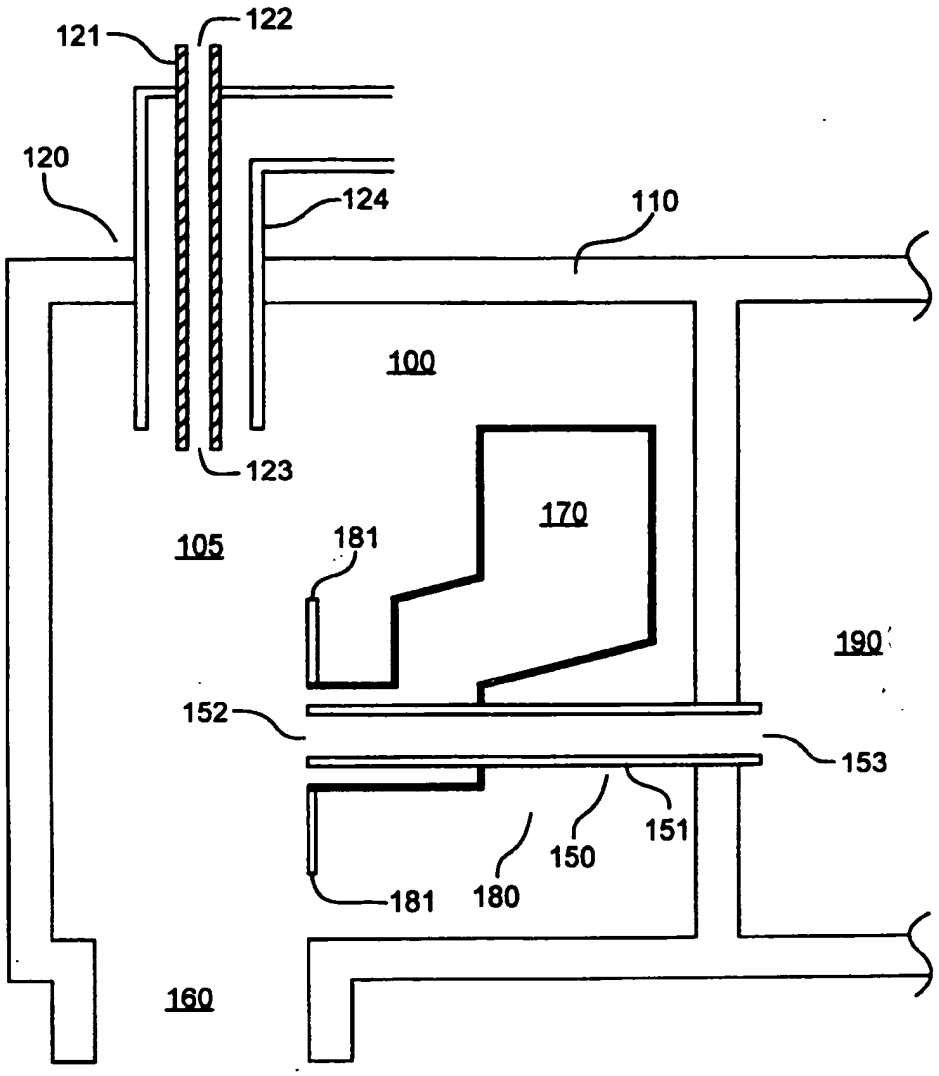


FIG. 1
(PRIOR ART)

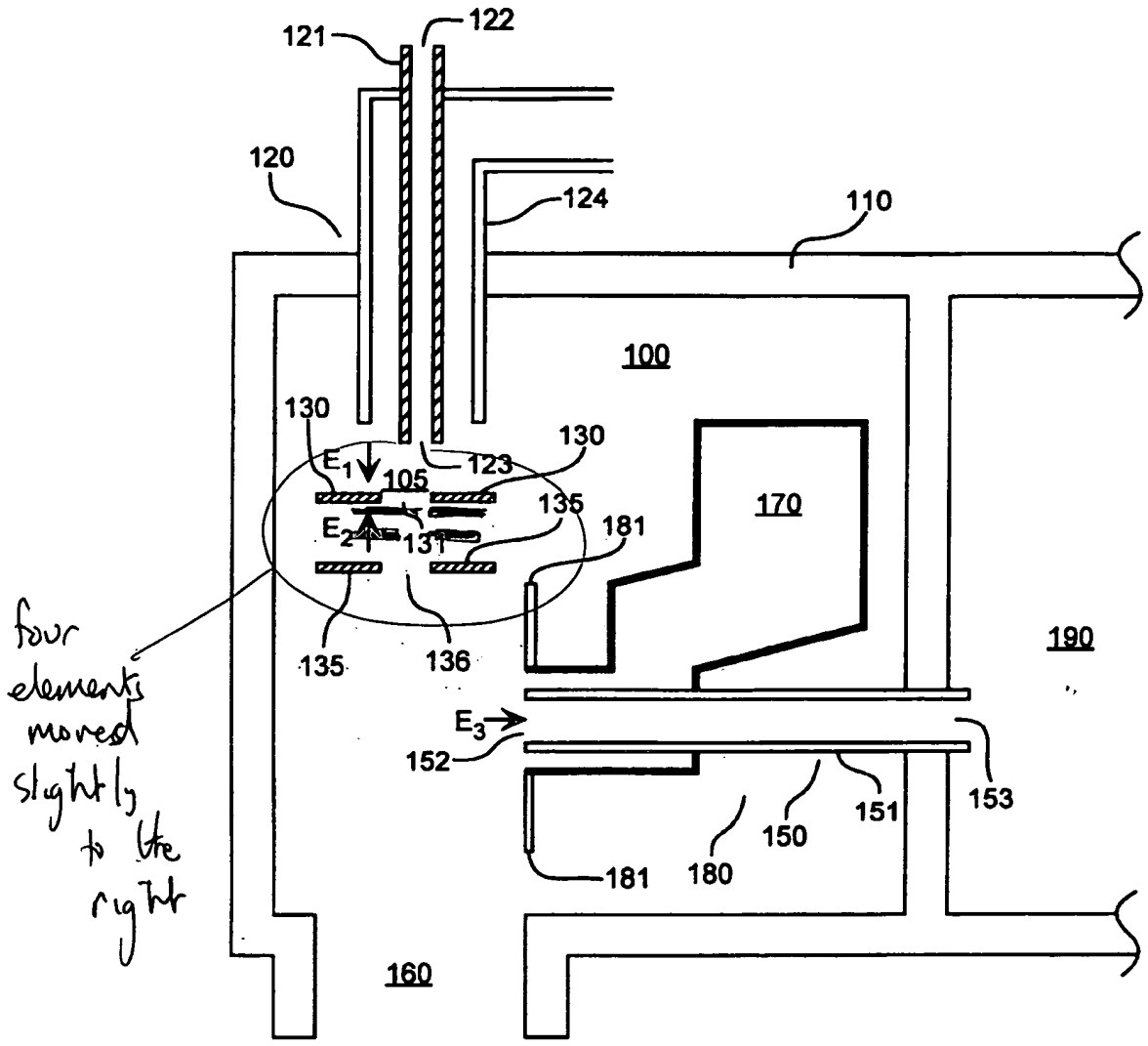


FIG. 2

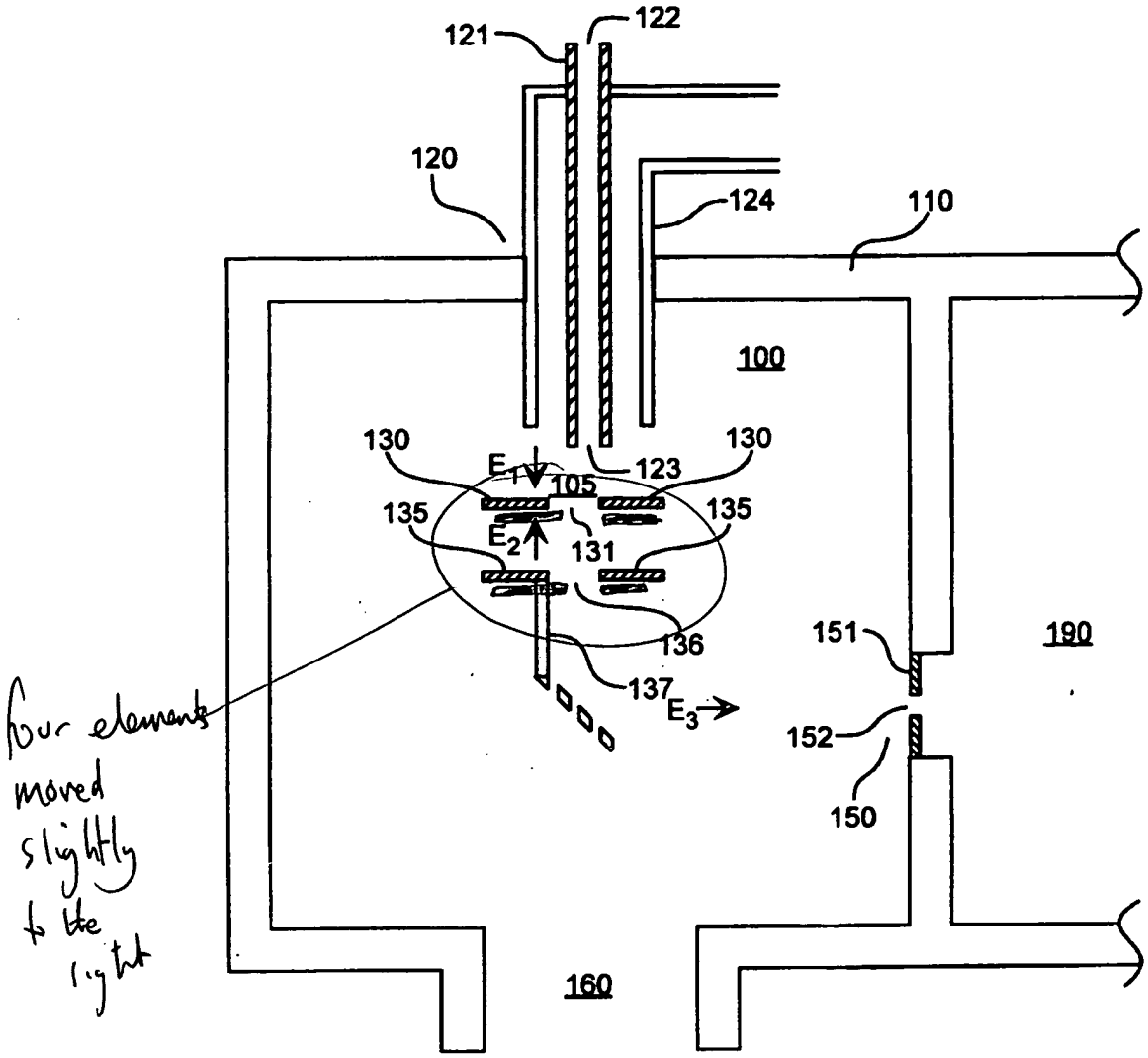


FIG. 3

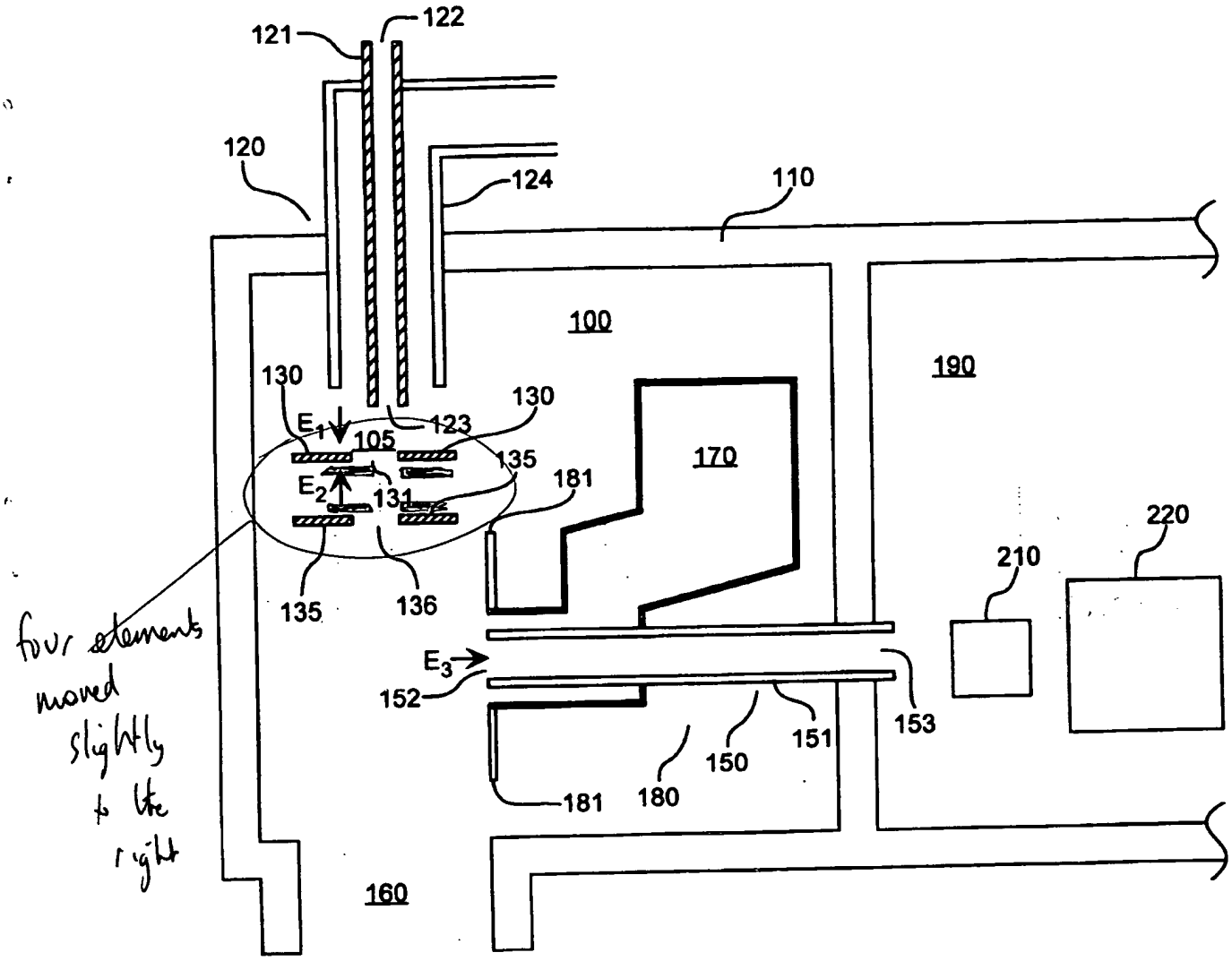


FIG. 4